



IFW 2811

**PATENT APPLICATION**

**THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of

Docket No: Q96219

Yasuhiro OKAMOTO, et al.

Appln. No.: 10/588,775

Group Art Unit: 2811

Confirmation No.: 9772

Examiner: Not yet assigned

Filed: August 8, 2006

For: FIELD EFFECT TRANSISTOR

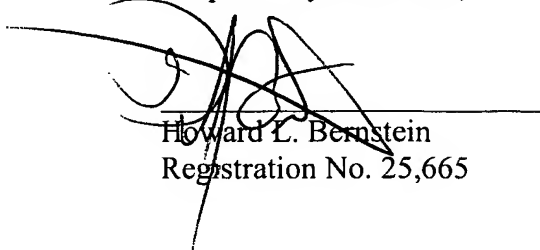
**SUBMISSION OF INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

For the Examiner's convenience, enclosed herewith is a copy of the English translation of the International Preliminary Report on Patentability (IPRP). It is assumed that copies of the cited references as required by §371(c) will be supplied directly by the International Bureau, but if further copies are needed, the undersigned will undertake to provide them upon request.

Respectfully submitted,



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WASHINGTON OFFICE

**23373**

CUSTOMER NUMBER

Date: November 9, 2006

From the INTERNATIONAL BUREAU

**PCT**

NOTIFICATION OF TRANSMITTAL  
OF COPIES OF TRANSLATION  
OF THE INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY  
(CHAPTER I OR CHAPTER II  
OF THE PATENT COOPERATION TREATY)  
(PCT Rules 44bis.3(c) and 72.2)

To:

MIYAZAKI, Teruo  
8th Floor, 16th Kowa Bldg., 9-20, Akasaka 1-chome,  
Minato-ku, Tokyo  
1070052  
JAPON



Date of mailing (day/month/year) 28 September 2006 (28.09.2006)	
Applicant's or agent's file reference NEC04P200	— IMPORTANT NOTIFICATION
International application No. PCT/JP2005/002712	International filing date (day/month/year) 21 February 2005 (21.02.2005)
Applicant NEC CORPORATION et al	

## 1. Transmittal of the translation to the applicant.



The International Bureau transmits herewith a copy of the English translation of the international preliminary report on patentability (Chapter I).



The International Bureau transmits herewith a copy of the English translation of the international preliminary report on patentability (Chapter II).

## 2. Transmittal of the copy of the translation to the designated or elected Offices.

The International Bureau notifies the applicant that copies of that translation have been transmitted to the following designated or elected Offices requiring such translation:

None

The following designated or elected Offices, having waived the requirement for such a transmittal at this time, will receive copies of that translation from the International Bureau only upon their request:

AE, AG, AL, AM, AP, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EA, EC, EE, EG, EP, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OA, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

## 3. Reminder regarding translation into (one of) the official language(s) of the elected Office(s).

The applicant is reminded that, where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary report on patentability (Chapter II).

It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned within the applicable time limit (Rule 74.1). See Volume II of the PCT Applicant's Guide for further details.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland  Facsimile No. +41 22 338 82 70	Authorized officer  Yoshiko Kuwahara  Facsimile No. +41 22 338 82 70
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# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference NEC04P200	<b>FOR FURTHER ACTION</b>		See item 4 below
International application No. PCT/JP2005/002712	International filing date ( <i>day/month/year</i> ) 21 February 2005 (21.02.2005)	Priority date ( <i>day/month/year</i> ) 20 February 2004 (20.02.2004)	
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237			
Applicant NEC CORPORATION			

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> Box No. I | Basis of the report   |
| <input type="checkbox"/> Box No. II           | Priority  |
| <input type="checkbox"/> Box No. III          | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability  |
| <input type="checkbox"/> Box No. IV           | Lack of unity of invention  |
| <input checked="" type="checkbox"/> Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> Box No. VI           | Certain documents cited   |
| <input type="checkbox"/> Box No. VII          | Certain defects in the international application  |
| <input type="checkbox"/> Box No. VIII         | Certain observations on the international application   |

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).

Date of issuance of this report 19 September 2006 (19.09.2006)	
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland  Facsimile No. +41 22 338 82 70	Authorized officer  Yoshiko Kuwahara  e-mail: pt07@wipo.int

# PATENT COOPERATION TREATY

TRANSLATION

From the  
INTERNATIONAL SEARCHING AUTHORITY

PCT

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To:

Date of mailing  
(day/month/year)

Applicant's or agent's file reference  
**NEC04P200**

**FOR FURTHER ACTION**

See paragraph 2 below

International application No.

**PCT/JP2005/002712**

International filing date (day/month/year)

**21.02.2005**

Priority date (day/month/year)

**20.02.2004**

International Patent Classification (IPC) or both national classification and IPC

Applicant

**NEC CORPORATION**

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/JP

Authorized officer

Facsimile No.

Telephone No.

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/JP2005/002712

Box No. I Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This opinion has been established on the basis of a translation from the original language into the following language  
\_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (under Rule 12.3 and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

- ☐ a sequence listing  
☐ table(s) related to the sequence listing

b. format of material

- ☐ in written format  
☐ in computer readable form

c. time of filing/furnishing

- ☐ contained in the international application as filed.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.  
PCT/JP2005/002712

Box No. V	Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement		
1. Statement			
Novelty (N)	Claims	1-8	YES
	Claims		NO
Inventive step (IS)	Claim	8	YES
	Claims	1-7	NO
Industrial applicability (IA)	Claims	1-8	YES
	Claims		NO
2. Citations and explanations:			
<p>Document 1: JP 2000-100831 A (NEC Corp.), 07 April 2000, Paragraphs 0049-0055; Figs. 4, 5 &amp; US 6483135 B1</p> <p>Document 2: JP 2001-308110 A (Ricoh Co., Ltd.), 02 November 2001, Paragraphs 0009-0014; Figs. 1, 3 (Family: none)</p> <p>Document 3: JP 2004-22773 A (NEC Corp.), 22 January 2004; Fig. 1 &amp; WO 2003/107431 A1</p> <p>Document 4: JP 2003-273130 A (Matsushita Electric Industrial Co., Ltd.), 26 September 2003, Paragraph 0027 (Family: none)</p> <p>The inventions of claims 1-3 do not appear to involve an inventive step based on document 1 (paragraphs 0049-0055 and Figs. 4, 5) cited in the ISR or document 2 (paragraphs 0009-0014 and Figs. 1, 3) and document 3 (Fig. 1). Adopting the AlGaIn/GaN heterostructure described in document 3 for the inventions described in document 1 or 2 would be easy for a person skilled in the art.</p> <p>The invention of claim 4 does not appear to involve an inventive step based on documents 1 and 3. Successively changing the film thickness of the dielectric directly below the field plate portion, which changes in a step-like fashion, in the invention described in document 1 would be easy for a person skilled in the art.</p> <p>The invention of claim 5 does not appear to involve an inventive step based on document 1 or 2 and document 3 and document 4 (paragraph 0027) cited in the ISR. Adopting the SiON passivation layer described in document 4 for the invention described in document 1 or 2 would be easy for a person skilled in the art.</p>			

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/JP2005/002712

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: Box V.2

The inventions of claims 6 and 7 do not appear to involve an inventive step based on documents 1, 2, and 3. Adopting the SiO<sub>2</sub> film 8 and the SiN film 14 described in document 2 for the invention described in document 1 would be easy for a person skilled in the art.

The invention described in claim 8 is neither described in any of the documents cited in the ISR nor obvious to a person skilled in the art.